In the Claims

1-49. (Canceled)

50. (New) An isolated polypeptide selected from the group consisting of:

a) a polypeptide comprising a span of at least ten amino acids of amino acids 589 to 643 of SEQ ID NO: 2;

b) a polypeptide comprising amino acids 589 to 643 of SEQ ID NO: 2;

c) a polypeptide comprising amino acids 545 to 643 of SEQ ID NO: 2;

d) a polypeptide comprising SEQ ID NO: 2;

e) a polypeptide comprising SEQ ID NO: 4;

f) a polypeptide comprising SEQ ID NO: 6;

g) a mutein of any of (a) to (f), wherein the amino acid sequence has at least 50% or 60% or 70% or 80% or 90% or 95% or 99% identity to at least one of the sequences in (a) to (f);

h) a mutein of any of (a) to (f) which is encoded by a DNA sequence which hybridizes to the complement of the DNA sequence encoding any of (a) to (f) under moderately stringent conditions or under highly stringent conditions; and

i) a mutein of any of (a) to (f) wherein any changes in the amino acid sequence are conservative amino acid substitutions to the amino acid sequences in (a) to (f).

51. (New) The polypeptide according to claim 50, wherein said polypeptide is capable of binding to the Bγ subunit of the PP2A phosphatase.

52. (New) A potassium channel comprising at least one polypeptide of claim 50.

53. (New) The potassium channel according to claim 52, wherein said potassium channel is a homomeric channel comprised of polypeptides of claim 50.

54. (New) A purified polynucleotide encoding the polypeptide of claim 50, or a polynucleotide complementary thereto.

55. (New) The polynucleotide according to claim 54, wherein said polynucleotide is selected from the group consisting of:

a) a polynucleotide comprising nucleotides 1776 to 1929 of SEQ ID NO: 2.

b) a polynucleotide comprising nucleotides 1632 to 1929 of SEQ ID NO: 2.

c) a polynucleotide comprising SEQ ID NO: 1,

d) a polynucleotide comprising SEQ ID NO: 3,

e) a polynucleotide comprising SEQ ID NO: 5,

f) a polynucleotide complementary to the polynucleotides of (a) to (e).

56. (New) An expression vector comprising the polynucleotide of claim 54.

57. (New) The expression vector according to claim 56, wherein said vector is a gene therapy vector.

58. (New) A host cell comprising the expression vector of claim 56.

59. (New) A method of making a polypeptide, said method comprising the steps of culturing a host cell according to claim 58 under conditions suitable for the production of a polypeptide.

60. (New) The method according to claim 59, further comprising the step of purifying said polypeptide from the culture.

61. (New) An antibody that specifically binds to a polypeptide of claim 50.

62. (New) A method of screening candidate compounds for a modulator of the KCNQ2 polypeptide comprising the steps of:

a) contacting a KCNQ2 polypeptide with the candidate compound; and

b) testing the activity of said KCNQ2 polypeptide in the presence of said candidate compound,

wherein a difference in the activity of said KCNQ2 polypeptide in the presence of said compound in comparison to the activity in the absence of said compound indicates that the compound is a modulator of said KCNQ2 polypeptide.

63. (New) The method according to claim 62, wherein said candidate modulator compound is selected from the group consisting of a natural ligand, a small molecule, an antibody, an antisense RNA, an aptamer and a short interfering RNA.

64. (New) A method of treating a mental disorder comprising the administration of a modulator of a PP2A phosphatase to an individual in an mount effective to treat said mental disorder.

65. (New) The method according to claim 64, further comprising the administration of a known drug for said treatment of said mental disorder.

66. (New) The method according to claim 64, wherein said modulator modulates a polypeptide comprising exon 15b, positions 545 to 643 of SEQ ID NO: 2.

67. (New) The method according to claim 64, wherein said mental disorder is selected from the group consisting of bipolar disorder, schizophrenia and depression.

68. (New) The method according to claim 67, wherein said mental disorder is bipolar disorder.

69. (New) A method comprising determining the identity of a nucleotide at a KCNQ2-related biallelic marker or the complement thereof in a biological sample.

70. (New) The method according to claim 69, wherein said biological sample is derived from a single individual.

71. (New) The method according to claim 70, wherein the identity of the nucleotides at said biallelic marker is determined for both copies of said biallelic marker present in said individual's genome.

72. (New) The method according to claim 71, wherein said determining is performed by a microsequencing assay.

73. (New) The method according to claim 71, further comprising amplifying a portion of said sequence comprising the biallelic marker prior to said determining step.

74. (New) The method according to claim 73, wherein said amplifying is performed by PCR.

75. (New) The method according to claim 68, wherein said genotyping step identifies a PP2A/Bγ-related biallelic marker selected from the group consisting of 30-2/62 and 30/7-30 (as depicted in table 3B) and the complements thereof.

76. (New) The method according to claim 75, further comprising the step of correlating the result of the genotyping step with a risk of suffering from a mental disorder.

77. (New) The method according to claim 76, wherein presence of a genotype "AG" at biallelic marker 30-2/62 is indicative of a risk of suffering from a mental disorder.

78. (New) The method according to claim 76, wherein the presence a haplotype "CC" at biallelic marker 30-7/30 is indicative of a risk of suffering from a mental disorder.

79. (New) The method according to claim 76, wherein said mental disorder is selected from the group consisting of bipolar disorder, schizophrenia and depression.

80. (New) The method according to claim 79, wherein said mental disorder is bipolar disorder.

81. (New) A method of assessing the efficiency of a modulator of a KCNQ2 polypeptide for the treatment of a mental disorder, said method comprising administering said modulator to an animal model for said mental disorder; wherein a determination that said modulator ameliorates a representative characteristic of said mental disorder in said animal model indicates that said modulator is a drug for the treatment of said mental disorder.

82. (New) The method according to claim 81, wherein said animal model is the STOP-/- mice with synaptic defects and severe behavioral disorders.

83. (New) The method according to claim 81, wherein said KCNQ2 polypeptide is a polypeptide of claim 1.

84. (New) The method according to claim 81, wherein said modulator specifically modulates a polypeptide comprising exon 15b, positions 545 to 643 of SEQ ID NO: 2.

85. (New) The method according to claim 81, wherein said mental disorder is selected from the group consisting of bipolar disorder, schizophrenia and depression.

86. (New) The method according to claim 81, wherein said mental disorder is bipolar disorder.